Peabody, Daniel (EGLE)

From: Ruesch, Paul <ruesch.paul@epa.gov>
Sent: Tuesday, January 10, 2023 5:52 PM
To: Peabody, Daniel (EGLE)
Cc: Trumble, Luke (EGLE); Mills, Mark (DNR); Gunderman, Brian (DNR); Ertel, Patrick (DNR)
Subject: EPA response to 9/29/2022 & 12/12/2022 SOM comment letters
Attachments: 230110 EGLE comment response letter.pdf; 230110 Response to SOM Comments.xlsx

Good Afternoon –

Please see attached letter and enclosure as a follow up to EPA's letter dated 12/19/2022 in response to letters from the State of Michigan dated 9/29/2022 and 12/12/2022 on the revised Removal Action Work Plan and revised design documents submitted on 8/17/2022 by the PRP related to the OU5 Area 4 TCRA.

As stated in the letter, I am available to discuss both the letter and the spreadsheet.

Thank you for your continued interest and support for this project.

Paul Ruesch
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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, ILLINOIS 60604

REPLY TO THE ATTENTION OF:
SE- 5J

January 10, 2023

Dan Peabody
State of Michigan Department of Environment, Great Lakes, and Energy (EGLE)
P.O. Box 30473, 525 West Allegan Street
Lansing, Michigan 48909-7973

RE: Response to State of Michigan comment letters dated September 29, 2022 and December 12, 2022 on the OU5 Area 4 Removal Work Plan Draft, Revision 1; Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site.

Dear Mr. Peabody:

The U.S. Environmental Protection Agency (EPA) received letters from the State of Michigan dated September 29, 2022 and December 12, 2022 providing comments on the above referenced Work Plan and associated supporting documents. It is EPA's understanding that the comments contained within these two letters cover all the State of Michigan's concerns on the above referenced work plan. As mentioned in EPA's December 19, 2022 letter to Mike Neller, enclosed is a spreadsheet providing a response to each State of Michigan comment submitted in both letters. The spreadsheet includes details and attempts to link each State comment to EPA's comments to the PRP disapproving the workplan on January 5, 2023.

With respect to entering both comment letters into the Administrative Record for the Site, please note that EPA does not establish an Administrative Record for approval or disapproval of work plans. Regardless, both the September 29, 2022 and December 12, 2022 letters will be included in the Site file and as appropriate will be incorporated into the Administrative Record for any future EPA actions related to Area 4 of the Site.

EPA does not anticipate further discussion with the State of Michigan on the January 5, 2023 disapproval letter or the version of the Work Plan that has been disapproved. Regardless, I am available to discuss any questions on EPA's response to the State's comments (enclosed). Finally, please be assured that EPA will continue to consult with the State of Michigan regarding subsequent submissions from the PRP.

Please contact me at (312) 919-4382 or ruesch.paul@epa.gov if you have any questions.

Sincerely,

Paul Ruesch

Paul Ruesch
On Scene Coordinator
Emergency Response Branch #2

Enclosure

cc: Mark Mills, Michigan DNR
Brian Gunderman, Michigan DNR
Luke Trumble, Michigan EGLE

WORK PLAN COMMENT / INPUT FORM - RESPONSE TO STATE OF MICHIGAN COMMENTS

Trowbridge Dam TCRA

DOCUMENT NAME: Revised Removal Work Plan, version 08/17/2022

NO.	REFERENCE TO GEI SUBMITTAL (i.e., Section X.X, Page XX)	COMMENT (+ reference(s) to support)	SUGGESTION / RECOMMENDATION	Comment # and/or Response (comment reference below)
		General Design/Stability Concerns		
1	General	Hard armoring of bed and banks during previous dam removal projects in Michigan have not typically been permitted due to impairments to ecological and stream function and extensive maintenance requirements, which result in additional environmental impacts.	Consider implementing dam removal and channel construction methods that rely less heavily on hard armoring and provide improved ecological and stream function in order to better align with typical state permitting requirements.	1
2	DRRS Report	Though coarsening of riffles can be a method to locally stabilize the streambed, the arrangement of these 12 riffles does not take into account their influence and dependence on one another. There are examples of riffles within these 12 that could be undermined through downstream scour and piping below riffle materials (when constructed on deposited sand). When one riffle fails, it compounds the forces on the next upstream riffle, leading to the potential for a "domino effect" of riffle bed failure and systemwide instability. Further to this, when reviewing floodplain undulations associated with low bank height, it seems contraction and expansion scour could add a third dimension/concentration point to localized scour adding risk to riffle stability.	Any riffle design needs to incorporate hydraulic influence from other channel features including adjacent riffles and floodplain undulation/expansion and contraction.	1
3	General	Treatment of bank failures through additional installation of rock will create channel dimensions that deviate from the original design and modeled conditions, likely further narrowing the channel, leading to increasing velocities and shear stresses that will exacerbate instability.	Design to dissipate energy, rather than outcompeting energy, therefore decreasing reliance on long-term maintenance of structures that will lead to deviations from modeled channel dimensions, risking further instability.	1
4	220901_GEI_A4_TCRA_Suppl Revised Design Submission Memo.pdf, Page 1 re design lifespan	The memo indicates that riffle and bank toe stone were sized to withstand a 100-year flood event or greater, citing stable particle design using the NRCS National Engineering Handbook, USGS, and USBR design criteria. However, in order for hardened banks and streambed to provide stability, long-term maintenance is required. Analysis of design life must incorporate long-term maintenance requirements and not solely focus on particle mobility during a single flood event. Language related to maintenance is generally included in the cited design criteria documents.	Consider long-term maintenance requirements of bank and bed hardening and include this in cost/risk analysis for design of stable channel and banks. Consider approaches that require less long-term maintenance or develop adequate plans and commit to performing long-term maintenance to ensure stability as required.	1
5	General	A monitoring and maintenance plan was not provided as part of this deliverable package. The State recognizes the importance of this plan in evaluating the proposed design as the State has considerable concerns regarding stability of the channel, safety of the conditions created, functionality of the restored system, and ability to restore native vegetation. Without this plan, the State is unable to holistically review the proposed design.	Develop the M&M plan IN CONJUNCTION with the design as it is finalized. Components of the design should include, but are not limited to: 1) develop as-builts of the completed work, 2) quantitatively evaluate the as-built design with a model calibrated by current, on-site measurements of water surface elevations and velocities that shows the as-built performance (velocities, shear stresses, WSE's for various flows up to 200 year events, etc.) vs. the modeled performance of the design, 3) Monitoring protocol, 4) monitoring frequency, 5) bank pins to measure erosion in areas of greatest concern, etc..	Components will be considered for inclusion in the Post-Removal Site Control (PRSC) work plan. EPA will continue to consult and coordinate with the State on work plan development/changes.
6	General	Undulations of floodplains can cause contraction and expansion scour as various flood discharges are able to access, or are prevented from accessing, floodplains. This scour can destabilize both bank and bed treatments on a local scale. However, these treatments all act in concert. So, instability in a localized reach, that was expected to provide stability to other treatments, can lead to systemic instability.	Design to dissipate energy through excavation of flood surfaces that parallel water surfaces for a given discharge rather than creating undulations of flood surfaces. Multi stage channels accomplish this concept well.	1
7	Full Design Plans	To date, state agencies have not been provided a full set of design plans. These plans have been requested and the request was acknowledged during previous meetings with EPA and the design team. Full plans are necessary to understand all design components and complete a thorough review.	Provide a full set of design plans for state agency review.	1, full set of design plans may not be available until prior to construction.
8	Removal Work Plan Draft, Revision 1 Section 6.2, page 23 and 24	Section 6.2 states that the riffle grade-control structure and the dam corridor banks will be constructed at least partially with rubblized dam foundation material. Concrete material from the dam foundation may be used to fill scour holes if clean, free of contamination, and has no protruding rebar. All reused concrete should be capped in natural material and cannot be placed within 1 foot of stable finish grade.	Revise Section 6.2 to state that the dam foundation material will only be used as described in this comment.	1, will be considered in dam removal plans.
9	General	Hydraulic conditions of the as-built project in Area 3, such as bank height ratios and/or entrenchment ratios, are more favorable for channel stability than much of the reach proposed in Area 4. However, numerous locations in Area 3 have already required, or are in need of, maintenance activities to rebuild/protect the designed structure. Those bank treatments of stone toe and toe wood are already succumbing to stream forces, in the 4 years since construction. The hydraulics proposed in significant portions of Area 4 are more aggressive than the as-built condition in Area 3.	Consider lessons learned from Areas 2 and 3 when considering bank stabilization methods in Area 4 and avoid reliance on methods that require long-term maintenance to provide stability.	1
10	General	Designs include extensive armoring of banks due to high water velocity and shear stress. Sentiment has been expressed that the Kalamazoo River is heavily armored throughout the lower river (Morrow Dam to Lake Michigan) and impacts exist throughout the system and as a result the design can does not need to incorporate more natural features. The prevalence of hard armoring was evaluated throughout the Kalamazoo River from Morrow Dam to Kalamazoo Lake (excluding Lake Allegan). Natural shorelines made up 92.3% of the riverbanks over this stretch. Sites where Superfund projects were 51.6% armored with rock and only 48.4% natural, much of which is toe wood structures in area 3. The remaining stretches of the river comprise of 95% natural shorelines. The two riffles located in area 3 (former dam riffle and constriction riffle) are by far the most aggressive riffles in the lower Kalamazoo River. These riffles as built are also more aggressive than modeled in the proposed design for area 3.	Artificial design constraints based on existing infrastructure should not be utilized. Allowing for armoring and riffles because of perceived impacts in other locations in the watershed is not only inappropriate, but not supported by the empirical evidence. The lower 23 miles of the Kalamazoo River is a designated Natural River (Part 305 of P.A. 451 of 1994) and the section in the City of Kalamazoo is protected by a Natural Features Ordinance that ensure future protection on the river. Outside of the project areas, the river is wild and has very little development on the banks. A large portion of the river flows through the Allegan State Game Area and will not be subject to future development. Designing to match the worse features on the river ignores the and damages future conservation and recreation.	1
11	Appendix A, DRRS Design Summary, Section 2.1 TCRA Overview	Text in Section 2.1 states, "The project approach includes stabilization of the channel within Subareas C, D, E, and G and stabilization of tributaries to the main channel as appropriate. The existing river alignment will largely be maintained, except for a deviation through lower Subarea G, as is explained in Sections 3 and 5. Results of sediment poling and coring identified this alignment as the historical thalweg prior to construction of the Trowbridge Dam. A pilot channel will be constructed to achieve this configuration and facilitate the initial phase of bank remediation and channel construction."	EGLE reviewed the historical maps and poling data that were used to guide the collection of poling data during the PDI and determine the location of the historic thalweg, and provide a detailed writeup of our efforts and findings to the US EPA. EGLE's review suggests that the proposed channel alignment (traced in purple) falls outside of the historic pre-dam river channel alignment in two or three locations- 1) near the dam where the historic river channel ran further to the south and under what is currently the left earthen embankment, 2) upstream near the PCB dredge boundary where the historic channel ran further to the north into Subarea G than the proposed alignments, and 3) near the upstream boundary of the TCRA. EGLE's review also shows that the historic river channel is significantly wider than the proposed river channel over the entire 2.4-mile stretch and the pilot channel may encounter at least one historic island feature. Also, there appears to be significant differences between the pre-dam alignment in two surveys (1873 and 1895), particularly around the Thairpin turn* (circled in orange).	1, 2,4, EPA will consider & discuss with PRP.
12	Appendix A, DRRS Design Summary, Section 6.0 page 26 & Figure 33	Section 6.0 states, Based on the aforementioned, varying treatment techniques have been developed for the riverbanks, depending on modeled post-dam conditions in respective areas along the river. Treatments were selected based on a combination of publications and field experience, including research that has been conducted by the U.S. Army Corps of Engineers on the stability thresholds for various stream restoration techniques (Fischenich, 2001). These treatments (Figs. 30–33) include: · Vegetated bank stabilization without toe protection and without bioengineered soil lifts. · Bioengineered soil lifts with stone toe protection. · Bioengineered soil lifts with toewood."	When looking at the figures showing the proposed bank treatments and shear stresses (up to 150 lb/sf) how side-by-side it is difficult to understand how different bank treatments in certain locations were selected and whether the selected bank treatment is appropriate based on future conditions. For example, Treatment A is proposed along the left descending bank at RM45.20, RM45.50, but the model predicts significantly higher shear stresses along the LDB near RM45.20 and RM45.50. And, there are a few locations where we see short and sharp transitions between different bank treatment types and it is difficult to understand how those are justified. Do the results from the H&H model provide the resolution necessary to have confidence in these finer-scale decisions?	1, EPA will consider & discuss with PRP.
13	Appendix A, DRRS Design Summary, Memorandum, Figure 27a and 27b	Figure 27a and 27b provide existing and proposed conditions in Schnable brook and show that some fairly significant changes in the ground elevation, water surface elevation, and velocity will occur following removal of the dam. For example: 1. The (average daily) water surface elevation near the confluence of the Kalamazoo River (Station 120) to the first upstream riffle (Station 160) is low, very low (1 foot or less) and the (average daily) velocity from Station 120 to 160 is high, very high (3 ft/s to 5 ft/s). 2. Throughout the modeled domain (approx. 1100 feet) the predicted drop in the (average daily) water level ranges from ~1 ft. near the upstream boundary to >6 ft. near the confluence. 3. Throughout the modeled domain the predicted water velocities increase under all modeled flow conditions relative to the same flows under the existing condition with velocities increasing by up to a factor of 10 or more. 4. Significant downcutting of the sediment bed (ground elevation) in Schnable brook beginning just downstream of the confluence (Station 80) and extending upstream to the second proposed riffle (Station 700).	1. Given the significant drop in water levels and downcutting of the bed, how will NCR avoid the mobilization of contaminated sediments from Schnable brook following drawdown? How will NCR avoid exacerbating existing conditions during construction unless contaminated sediments and bank soils are remediated? Is Schnable brook expected to be wetland habitat and/or frequently inundated such that aquatic criteria are applicable? 2. Are the proposed conditions sufficient to allow resident fish to access Schnable brook from the Kalamazoo river (and vice versa)? 3. Given the significant change in conditions proposed, including increased velocities and decreased water depths, what other alternatives are available to increase connectivity between Schnable brook and the Kalamazoo river?	1, 2, EPA will consider & discuss with PRP.
14	Appendix A, DRRS Design Summary, Section 6.2	Text in Section 6.2 states, "In the highest energy areas of the river (typically where near bank 100-year flow shear stresses exceed approximately 1 pounds per square foot or 100-year velocities exceed 5 feet per second), in locations where bank geometry warrants, in places that may have higher levels of human traffic, or in places where PCBs are presumed to remain in the adjacent floodplain, a rock toe will be used to stabilize the river toe and/or riverbanks."	Please clarify how the frequency of human traffic was developed and identify which locations are areas of "high traffic" on a figure. The FS and ROD have no been developed for Area 4 and post-ROD sampling to delineate remedial footprints has not been completed, so it would be presumptive to suggest which portions of the floodplain will and will not be removed. Remove presumptive language.	EPA will consider & discuss edit with PRP.
15	Appendix A, DRRS Design Summary, Memorandum, Figure 28a, 28b, 28c	EGLE has similar comments as those above for Osgood Drain, which shows an even greater change than what was just described for Schnable Brook. Changes in the conditions for Osgood Drain are shown in Figures 28a, 28b, and 28c. However, one key difference between the predicted change at Osgood Drain compared to Schnable Brook is the significant lowering of the existing bed (ground) elevation throughout the modeled domain (approx. 900 ft.), which significantly increases the slope.	1. Given the significant drop in water levels and downcutting of the bed, how will NCR avoid the mobilization of contaminated sediments from in and near Osgood Drain following drawdown? How will NCR avoid exacerbating existing conditions during construction unless contaminated sediments and bank soils are remediated? 2. Given the significant change in conditions proposed, including increased velocities and decreased water depths, what other alternatives are available?	1, 2, EPA will consider & discuss with PRP.
16	Appendix A, DRRS Design Summary, Memorandum, Figure 31 and 32	For the "stone" that is proposed is it rounded or angular? Figures state that stone will be a minimum of 12" in diameter for at least one bank treatment. Is there a maximum diameter? Where does NCR expect to find 'boulders' on site for use? Explain what is meant by 'maximizing stone content to the greatest extent possible'- is there a minimum amount of stone that is required based on the design and post construction conditions? For the "Type B" treatment, provide a range for 'variable' stone sizes and provide callouts showing the proposed stone size at locations where "Type B" treatments will be installed .	Provide information on specific elements of the bank treatments.	1
17	Appendix B, Sequence of Work Drawings	The sequence of work includes dredging in Subarea E (Steps 3,4,5,7,8) followed by lowering water levels via the WCS (Step 12 and 12a). Lowering water levels will encourage mobilization of sediments located within and outside of the TCRA boundary that could settle in the dredge footprint.	How will NCR avoid recontamination of Subarea E (and other Subareas) during the drawdown? Revise the schedule so that the cleanup progresses in a logical fashion (upstream to downstream) to avoid recontamination of previously remediated areas.	1, EPA will consider & discuss with PRP.
18	Revised Design Supplemental Submittals, Tributary and Riffle Grading Plans and Details		1. The design drawings do not appear to include a notched thalweg within the proposed riffles, which could improve passage under low-flow conditions. Was the installation of a low-flow channel within the riffles explored or considered? What are the pros and cons of including a low-flow channel through the riffles? 2. At least one riffle location (RM 44.95) the constructed riffle is below the estimated dam out bathymetry, which is confusing. Is the downstream end of the riffle at RM44.95 depositional following dam removal? Please clarify how the constructed riffle(s) can be below the dam-out surface.	1
19	Hydrology, Hydraulics and Sediment Transport Model Technical Memorandum Figure 23 and 220831_GEI_A4 TCRA_Kzoo River Velocity Profiles.pdf	To allow upstream passage of all fish species and life stages, average velocities across a transect should be below 3.0 ft/s for flows up to and including the bankfull discharge. Many fish species (including walleye, northern pike, and suckers) migrate upstream to spawn in the spring when bankfull or near bankfull conditions are likely. According to Figure 23, average daily modeled future average velocity exceeds 3.0 ft/s at twelve locations. Eleven of these sites appear to correspond with proposed constructed riffle locations, and the uppermost site (RM 47.27) is upstream of the constructed riffles. Cross-sections indicate that modeled average daily velocities exceed 3.0 ft/s on >50% of the channel width on eight proposed constructed riffles and on >70% of the channel width on four riffles (RM 45.08, RM 46.36, RM 46.84, and RM 47.07). The riffle at RM 47.27 had the highest average cross-sectional velocity (4.9 ft/s) at average daily flows in Figure 23, but no cross-sectional data were provided to estimate percentage of stream width over 3.0 ft/s. At bankfull discharge, the modeled future average velocity exceeded 3.0 ft/s throughout most of the TCRA reach, including everything upstream of RM 47.18.	Reduce water velocities by increasing the stream width and/or extend the riffles longitudinally to decrease the slope.	1
20	Hydrology, Hydraulics and Sediment Transport Model Technical Memorandum, Figure 27b	To allow upstream passage of all fish species and life stages, average velocities across a transect should be below 3.0 ft/s for flows up to and including the bankfull discharge. Many fish species (such as northern pike and suckers) migrate upstream to spawn in the spring when bankfull or near bankfull conditions are likely. On Schnable Brook, proposed current velocities at average daily flows exceed 3.0 ft/s from station 145 to station 215 and from station 800 to 860. At bankfull flows, proposed current velocities exceed 3.0 ft/s from station 790 to station 870.	Reduce elevation of grade control structure at station 220 from 655 ft to 654 ft. Construct an additional grade control riffle near station 750.	1, EPA will consider & discuss with PRP.
21	220831_GEI_A4 TCRA_Kzoo River Water Velocity Profiles & Figure 26a. Area 4 Plan View of Water Depth for Average Daily Flow in Modeled Alignment	Shand et al (2011) provided criteria for assessing risk to adults wading through flowing water based on depth and current velocity. These criteria were used to classify the 12 Area 4 TCRA cross-sections with water velocity profiles at average daily flows. Water depths were inferred from Figure 26a. These depths were presented in ranges. For the purpose of the risk assessment, the top end of this range was used (e.g., 2-3 ft was treated as a depth of 3 ft). At each cross-section, the first data point was station 0 and depth times velocity was evaluated every 20 ft across the transect (i.e., station 0, 20, 40, etc.). This method resulted in risk ratings for 82 points across the 12 cross-sections. Six points scored as moderate risk, 40 points scored as significant risk, and 13 points scored as extreme risk. All cross-sections had points rated significant risk. Extreme risk points were found at RM 44.96, RM 45.08, RM 45.16, RM 45.32, RM 45.59, RM 45.77, RM 46.16, and RM 47.07. Thus, people attempting to wade or (more likely) paddlers that capsize in the riffles could be swept downstream. The falling risk is further elevated by the large rocks used to construct the riffles. Citation: Shand, T. D., G. P. Smith, R. J. Cox, and M. Blacka. 2011. Development of appropriate criteria for the safety and stability of persons and vehicles in floods. Proceedings of the 34th International Association for Hydro-Environment Engineering and Research Conference, June 26-July 1, 2011, Brisbane, Australia.	Reduce water velocities in the riffles by increasing the stream cross-sectional area and/or lengthening the riffles to reduce slope.	1, EPA will consider & discuss with PRP.

	A	B	C	D	E
3	**DOCUMENT NAME: Revised Removal Work Plan, version 08/17/2022**				
4	**NO.**	**REFERENCE TO GEI SUBMITTAL (i.e., Section X.X, Page XX)**	**COMMENT (+ reference(s) to support)**	**SUGGESTION / RECOMMENDATION**	**Comment # and/or Response (comment reference below)**
27	22	Hydrology, Hydraulics and Sediment Transport Model Technical Memorandum Figure 11	Shand et al (2011) provided criteria for assessing risk to adults wading through flowing water based on depth and current velocity. Average water velocities and average water depths for the proposed Area 4 TCRA reach at bankfull flows were calculated using data from Table 11. Fifty-three sites scored as extreme risk. The remaining nine sites scored as significant risk. Thus, people attempting to wade or (more likely) paddlers that capsize in the river could be swept downstream. The falling risk is further elevated by the large rocks used to construct the riffles. Citation: Shand, T. D., G. P. Smith, R. J. Cox, and M. Blacka. 2011. Development of appropriate criteria for the safety and stability of persons and vehicles in floods. Proceedings of the 34th International Association for Hydro-Environment Engineering and Research Conference, June 26-July 1, 2011, Brisbane, Australia.	Reduce water velocities by increasing the stream cross-sectional area and possibly by lengthening the riffles to reduce slope.	1, EPA will consider & discuss with PRP.
28			**Soil/Sediment Related Concerns**		
29	23	General	In order to allow for any dredging, mobilization, or disposal (either onsite of off) of impounded sediments, adequate characterization and management plans need to be provided to the state for review and approval. These documents need to be reviewed and approved by Water Resources Division, Remediation and Redevelopment Division, and Materials Management Division of EGLE. Though some of this data has been provided to EGLE in PDI Phase III, some data is still outstanding, more data an analysis may be required if exceedances of applicable criteria occur, and a sediment management plan that considers all relevant data has not yet been provided.	Provide to EGLE for review and approval all relevant sediment data as it becomes available and develop a comprehensive sediment management plan based on the results of this data collection.	3, all data has been provided in data viewers, PDI reports and spreadsheets.
30	24	General	The State does not support on-site disposal of dredged sediment based on currently available data (not all data is yet available). Additionally, the State believes that the location proposed for disposal will remain wetland post-dam-removal and should not be considered for disposal.	Consider alternative disposal approaches. State will re-evaluate this stance when all data is available.	3, all data has been provided in data viewers, PDI reports and spreadsheets.
31	25	Removal Work Plan Draft, Revision 1	Sediment volume proposed to be mobilized, even if chemically inert, would result in significant physical impacts to downstream communities.	Reduce volume of mobilized material that will impact downstream ecological communities and receptors.	2
32	26	Removal Work Plan Draft, Revision 1 / PDI-III_T113111A_Sediment_Results_v20220926 All	Existing draft analytical data from PDI III suggest that the sediment contains contaminants that exceed ecological screening levels, based on this information, sediment would not be allowed to mobilize under State criteria. Additional data is pending from PDI III (PCBs), and PDI IV. State will re-evaluate this stance when all data is available.	Conduct bioassay to determine biological availability of contaminants. Provide excel format analytical results from PDI III, and PDI IV, to facilitate comparisons with appropriate criteria.	3, all data has been provided in data viewers, PDI reports and spreadsheets.
33	27	Removal Work Plan Draft, Revision 1	Regarding dredge prisms/dredge management units, it's not clear how many samples were used to derive prisms, how many dredge prisms are being proposed, and how confirmation sampling will take place.	Please supply a map showing dredging prisms, PDI samples used to develop cutlines within those prisms, and provide explanation on how many confirmation samples will be used post-dredge to evaluate progress towards RAL/CUGs. Will the dredge prisms be used as units for confirmation sampling? Please provide confirmation sampling SOP for review prior to finalization and implementation. A residuals management plan should be developed to determine necessary actions if RAL/CUGs are not reached after initial dredge. How are pilot channel materials going to be handled, if the PDI III and IV results demonstrate presence of contaminated material? Other analytes, outside of PCBs (please see WRD-048) should be analyzed for during confirmation sampling.	3, 4, to be addressed in Field Sampling Plan (FSP) - confirmation sampling plan. A 'residual management plan' is not anticipated, and PCBs only will be considered during confirmation sampling.
34	28	Section 3 Project Approach, Section 5.4.1, Dredging (duplicate)	Regarding dredge prisms, it's not clean how many samples were used to derive prisms, or how many dredge prisms are being proposed.	Please supply a map showing dredging prisms, samples used to develop cutlines within those prisms, and provide explanation on how many confirmation samples will be used post-dredge to evaluate progress towards RAL/CUGs. Will the dredge prisms be used as units for confirmation sampling? Please provide confirmation sampling SOP for review prior to finalization and implementation. A residuals management plan should be developed to determine necessary actions if RAL/CUGs are not reached after initial dredge. How are pilot channel materials going to be handled, if the PDI III and IV results demonstrate presence of TSCA material? Other analytes, outside of PCBs (please see WRD-048) should be analyzed for during confirmation sampling.	3, 4, to be addressed in Field Sampling Plan (FSP) - confirmation sampling plan. A 'residual management plan' is not anticipated, and PCBs only will be considered during confirmation sampling.
35	29	PDI-III_T113111A_Sediment_Results_v20220926 All	Several analytical results appear to be non-detect, with detection limits in exceedance of relevant standards and/or screening values.	Please provide a contingency plan for instances where final analytical results are non-detect, and detection limits that are above relevant standards and/or screening values.	not submitted to PRP. Approved QAPP is in place for all analyses.
36	30	Removal Work Plan Draft, Revision 1	Scope of work states sediment dredging will be limited to subarea E, with limited portions in subarea G. Figure F proposes sediment dredging in area F.	Is the project proposing to remove contaminated sediment above CUG/RALs from subarea F? Please update text, or map.	3
37	31	RWP, Appendix A, 2.1, Page 4	The State does not support disposal or placement of dredged or excavated material in Subarea F. It is MDNR's belief that, following dam removal, this area will remain wetland. Therefore, filling of that area would constitute filling of a wetland. Removal of the dam will result in some loss of wetland area so those areas that may remain wetland post-removal should be protected to allow for the wetland impacts to be minimized. This comment is independent of the chemical analyses of the proposed fill material.	Look for other disposal routes for dredged materials not required to go to landfill due to PCB contamination. The State will consider other on-site options pending the proposed sampling to characterize sediments.	3
38	32	General	The State does not support "beneficial reuse" of material based solely on said material testing below action levels for PCBs.	Follow State criteria for evaluating reusability or placement of materials.	3
39	33	Removal Work Plan Draft, Revision 1 Section 5.4.1, Page 17	Sediments in the side channel area of Subarea F are shown to target 11mg/kg in the cross sections in appendix C. EGLE strongly disagrees with this approach as this area is an active portion of the river and not a floodplain during sediment removal. Additionally this design is planning to remove lower level surface concentrations and replace them with higher concentrations above the sediment FRG.	Target 1 mg/kg for removal in Subarea F	3
40	34	Removal Work Plan Draft, Revision 1 Section 5.4.1, Page 17 and Figure 6	This section states that approximately 150,000 cubic yards of material from the pilot channel will be deposited in Subarea F. These sediments may have concentrations up to 11 mg/kg, which are five to ten times higher than existing surface concentrations (most are around 1 or 2 mg/kg as shown on cross sections in appendix c), and therefore may result in a significantly worse conditions than exist currently.	Sediment from the pilot channel should be sampled and if placed in Subarea F, should be placed in areas where existing conditions match the material being filled. If that is not possible the pilot channel material should be disposed of. It is irresponsible to take an area with no exceedances over 1 mg/kg and transform that area into an 11 mg/kg contaminated region.	3
41	35	General	Does the volume of material being projected to erode include mobilization of materials above RM47.25 but within the current influence of the Trowbridge dam impoundment? A total estimate of 330,000yd3 is given for the TCRA, but the documents identify the intent to reuse and dispose of a significant quantity of material on-site during the TCRA. Does the 330,000yd3 only include material going to the landfill or does it also include material proposed for re-use/disposal on-site? If so, what is the total volume being hauled for off-site disposal and what are the total volumes proposed for reuse? EGLE has not seen figures showing where "clean" materials proposed for re-use would originate from or a formal plan detailing what steps would be taken to try and separate "clean" from "dirty" material based on the PCB remediation cuts that are included in the figure set.	Clarify volumetric estimates. Identify sources of material proposed for reuse.	2, 3, estimates to be clarified and sources of material proposed for reuse to be specified.
42	36	General (duplicate)	Does the volume of material being projected to erode include mobilization of materials above RM47.25 but within the current influence of the Trowbridge dam impoundment? A total removal estimate of 330,000yd^3 is given for the TCRA, but the documents identify the intent to reuse and dispose of a significant quantity of material on-site during the TCRA. Does the 330,000yd3 only include material going to the landfill or does it also include material proposed for re-use/disposal on-site? If so, what is the total volume being hauled for off-site disposal and what are the total volumes proposed for reuse/on-site disposal? EGLE has not seen figures showing where "clean" materials proposed for re-use would originate from or a formal plan detailing what steps would be taken to try and separate "clean" from "dirty" material based on the PCB remediation cuts that are included in the figure set.	Clarify volumetric estimates. Identify sources of material proposed for reuse.	2, 3, estimates to be clarified and sources of material proposed for reuse to be specified.
43	37	PDI Phase 3 Data	As mentioned in EGLE's previous comment letter, the Phase 3 PDI data should be compared to the US EPA Region 5 Ecological Screening Levels and it would not be appropriate to simply screen results against EGLE's Part 201 nonresidential criteria. And, what is described is consistent with the approach already taken at the Site at OU7 - Plainwell Mill (OU7 SRI Report, Appendix J, https://semspub.epa.gov/work/05/911856.pdf)	Revise tables and insert appropriate screening levels into analytical summary table.	3
44	38	PDI Phase 3 Data (duplicate)	As mentioned in EGLE's previous comment letter, the Phase 3 PDI data should be compared to the US EPA Region 5 Ecological Screening Levels and it would not be appropriate to simply screen results against EGLE's Part 201 nonresidential criteria. This approach is consistent with the approach already taken at OU7 - Plainwell Mill (OU7 SRI Report, Appendix J, https://semspub.epa.gov/work/05/911856.pdf)	Revise tables and insert appropriate screening levels into analytical summary table.	3
45	39	RWP	Section 3.1 Cleanup Levels, page 18, states, " Additionally, limited floodplain areas adjacent to Subarea G will be included as part of the PCB dredging work. This area will be addressed using the instream sediment cleanup standard. A remedial action level (RAL) of 11 mg/kg for floodplain soils has been established in Record of Decisions (RODs) in other portions of the river. This RAL will be considered when placing pilot channel material in Subarea F."	In previous discussions, EGLE raised concern about the adequacy of the plan to characterize pilot channel and erodible sediments, and MDNR expressed that they would not allow those materials to be placed on their property. Based on previous discussions, GEI and NCR are speaking with the Custodial Trust at Operable Unit 1 about placing pilot channel materials in the Allied Landfill as part of the remedial action. If that alternative is being explored why is it not included in the text? Update the text to include all possible and reasonable alternatives.	4
46	40	RWP	Section 4.0 PDI Objectives, page 19, provides a list of tasks and objectives of the PDI, which includes: " Verifying and delineating the extent of sediments or bank-soil locations within the TCRA boundary with ≥50mg/kg PCBs requiring separate handling and disposal under TSCA regulations." While Section 4.0 references an objective of delineating all TSCA-level material within the TCRA footprint, text in Section 3.0 Project Approach doesn't clearly indicate that all TSCA-level materials within the TCRA footprint will be removed.	Clarify if all TSCA-level PCB waste that has been identified within the TCRA footprint will be removed as part of this removal action.	1, 4
47	41	RWP	Figure 6 shows the proposed location of the pilot channel and locations in the F Islands that are proposed for excavation based on the 11ppm total PCB RAL for floodplain soils. However, no data is shown on the figure to support the F Island excavation area, and TSCA-level materials in these Islands is not included in the proposed extent of excavation. And, data available within and adjacent to the pilot channel is also not shown.	In Figures like these, it is helpful when the available data is "turned on" so that the reader can understand the level of contamination within and adjacent to the proposed dredge and excavation footprints. If possible, please provide a reference to a figure that shows all available data and the proposed pilot channel and F Island footprints. If no such figure is available, please create a figure and "turn on" all available data.	3
48	42	RWP, Appendix A, Dam Removal and River Stabilization (DRRS) Design Summary, Section 2.1 TCRA Overview	Text in Section 2.1 states, "Consistent with anabranch filling methods prescribed in the Record of Decision for Area 2, material removed from Subareas C and D as part of pilot channel construction will be relocated to the Subarea F footprint and placed as fill."	PCB contaminated materials and material that visually resembles "paper waste" should not be used as "fill", and approval from the landowner(s) will be needed before "fill" material can be imported. As a reminder, the Phase 3 PDI did not have an adequate sample size to characterize the nature and extent of contamination in the pilot channel sediments, and to EGLE's knowledge there is no plan for additional characterization of these materials.	1, EPA will consider & discuss with PRP, 3
49	43	Appendix B, Sequence of Work Drawings, Work Sequence Plan Sheet 3 of 8	Detail 5 includes stockpiling of "clean" soils and sediments from "Beaver Island".	Based on conversations with the US EPA during the Phase 3 PDI, EGLE was under the impression that there was no desire to harvest and reuse materials outside where the pilot channel would be dredged and the Phase 3 PDI did not propose characterizing materials in "Beaver Island". Therefore, these materials cannot be beneficially reused without first taking steps to appropriately characterize them. If analytical information for this island exists please provide it. Otherwise, delete references to reusing "Beaver Island" sediments.	1, EPA will consider & discuss with PRP.
50	44	Appendix B, Sequence of Work Drawings, Work Sequence Plan Sheet 6 of 8	A note on Sheet 6 of 8 states, "CONDUCT CONFIRMATION SAMPLING AT THE BASE OF THE BANK CUT ELEVATION."	A confirmation sampling plan has not been provided for review or approved by the US EPA, so it would be premature and inappropriate to propose confirmation sample strategies in the work sequence drawings. Remove the notes related to confirmation sampling strategies.	to be addressed in FSP - confirmation sampling plan. EPA will continue to consult and coordinate with the State on work plan development/changes.
51	45	Appendix C PCB Cross Sections		1. Explain how the decision to make a "6" smoothing cut" was made and what, if any, benefit is provided by the "6" smoothing cut" where it is included. As of now, the only figure that includes a 6" smoothing cut is Figure 14. Are there other locations where this approach is being considered but aren't included in Appendix C? If so, where? If not, what benefits would be provided by adding a "6" smoothing cut" in locations where one is not proposed? 2. Where possible, "broken" cross sections for upstream transects should be filled in with available data, including the recent bathymetric data that was collected as part of the PDI. If chemical information across these transects is available but not shown it should also be "turned on". 3. It would be helpful to show similar flow conditions for the dam-in and dam-out scenarios so that the reader has a frame of reference for comparison. As they are presented, the figures include the "dam-in normal water surface elevation" and the "dam-out bankfull water surface elevation".	4, EPA will consider & discuss with PRP.

	A	B	C	D	E
3	**DOCUMENT NAME: Revised Removal Work Plan, version 08/17/2022**				
4	**NO.**	**REFERENCE TO GEI SUBMITTAL (i.e., Section X.X, Page XX)**	**COMMENT (+ reference(s) to support)**	**SUGGESTION / RECOMMENDATION**	**Comment # and/or Response (comment reference below)**
52	46	Appendix D Bank Cross Sections		1. The drawings say "see sheet xx-xxx for rock sizing". Please reference a sheet that provides details on rock sizing. 2. Provide cross-section drawings that cover the entire channel instead of "broken" cross sections that are incomplete and difficult to interpret. 3. EGLE notes that the cross section transect lines in Appendix D and Appendix C are different. How were transect lines in Appendix D selected? If possible, it would be helpful to if (at least a few) cross sections shown in Appendix D ran along the same transect lines as cross sections shown in Appendix C. 4. The PCB cuts shown in Appendix C do not extend into the banks in Subarea E, but Appendix D shows bank treatments are planned for Subarea E. What, if any, remediation will be completed for these banks before installing the treatments given that the data available shows elevated concentrations of PCBs in Subarea E banks?	1, 4
53	47	Revised Design Supplemental Submittals Memorandum dated 9/1/22		The memorandum identified three locations where GEI anticipates harvesting "clean" soil for use in bank buffer, and volumes. Based on conversations with the US EPA during the Phase 3 PDI, EGLE was under the impression that there was no desire to harvest and reuse materials outside where the pilot channel would be dredged and the Phase 3 PDI did not propose characterizing materials in "Beaver Island", the "Osgood spit" or the "LDB embankment at the dam". Therefore, these materials cannot be beneficially reused without first taking steps to appropriately characterize them. If analytical information for these areas exists please provide it. Otherwise, delete references to reusing these materials.	1, EPA will consider & discuss with PRP.
54	48	Section 3 Project Approach	Scope of work states sediment dredging will be limited to subarea E, with limited portions in subarea G. Figure F proposes sediment dredging in area F.	Is the project proposing to remove contaminated sediment above CUG/RALs from subarea F? Please update text, or map.	3
55	49	Section 3 Project Approach	Scope of work states sediment dredge spoils from pilot channel will be relocated to subarea F footprint and placed as engineered fill.	This proposed approach for sediment management has not been discussed until this document. Placement of dredge spoils in this proximity may have adverse impacts to the final remedy and continue to be a source of PCBs to the Kalamazoo River. Placement of pilot channel material within subarea F should be contingent upon review of PDI III and IV physical and chemical characterization results from the pilot channel, which are not available at this time. This proposed approach would be inconsistent with the text in the previous paragraph of Section 3 (i.e., if contaminated sediment is being removed from subarea F, to be filled with contaminated sediment from pilot channel).	3
56	50	Section 3 Project Approach, Section 3.1, Cleanup Standards	The remedial action level (RAL) of 11 mg/kg for floodplain soil has the potential to place a large mass of PCBs from the pilot channel in close proximity to the Kalamazoo River (subarea F). This represents a source of PCBs to wildlife, and a potential ongoing source of PCBs to the Kalamazoo River.	Placement of pilot channel material within subarea F should be contingent upon review of PDI III and IV physical and chemical characterization results from the pilot channel, which are not available at this time. Also, if subarea F is used spoils placement, has there been an evaluation of hydraulic connectivity between subarea F and the proposed channel? When is EPA anticipating PDI III results?	3, all data has been provided in data viewers, PDI reports and spreadsheets.
57	51	Section 3 Project Approach, Section 5.4.1, Dredging	Document describes in-situ averaging of TSCA-level material to produce average sediment concentrations <50 ppm total PCBs.	Averaging of TSCA-level material for the purposes of reuse in the described manner is not a standard practice. Averaging and reuse of this material l in close proximity to the final stream channel would not be endorsed, without some form of ex-situ characterization of the material. I would defer to EGLE-MMD and EGLE-RRD for further guidance on handling and disposal practice.	4, approach to TSCA material characterization was discussed and approved in FSP.
58	52	PDI Phase 1 and Phase 2, Data Summary Report, Section 11.3 Phases and Tasks of the PDI	Section states that sediment from subarea E was sampled in 100x100 grids. Subareas F and G were sampled using an adaptive grid approach. Are these grids going to be referenced for dredge prisms, and decisions units for meeting RAL/CUG during confirmation sampling ?	Please provide maps showing the sampling grids and PDI I/II locations. Please updated final design documents with this information, once PDI III results are available and other comments are addressed.	1, 3, 4, all data has been provided in data viewers, PDI reports and spreadsheets.
59	53	PDI Phase 1 and Phase 2, Data Summary Report, Section 5.2.3, TSCA Level PCB Extent	Figure 5-16 and associated TSCA figures reflect PDI I and II results. This excludes TSCA level PCB data that was previously identified in area C, and D as mentioned in the section.	Figures are misleading based upon known occurrence of TSCA material in subareas C and D. These figures should be subject to change based upon existing data and additional information collected from pilot channel under PDI III.	1, 4
60	54	PDI Phase 1 & Phase 2, Data Summary Report, 5.3 Conceptual Site Model Update	Sections states that PCB impacts are widespread along the majority of subarea C and D. My understanding is that the pilot channel is located near this area but does not completely encompass C and D. Areas C and D are being characterized as part of PDI III. How are PCB-impacted sediments going to be managed that aren't being actively dredged as part of the pilot channel?	Dredging footprint, and proposal handing and disposal of pilot channel sediment should be revised subject to PDI III results and regulatory review.	1, 3, 4
61	55	PDI Phase 1 & Phase 2, Data Summary Report, Fig. 4-11	Figure shows a historical TSCA level exceedance within subarea F. What year was this sample collected? How are materials from subarea F going to be handled and disposed of, knowing that sediment in these areas have potential TSCA exceedances?	Please provide year, or reports associated with this historical data. Is there evidence to suggest that this material is no longer present? Please include details in final design, including how dredged material from subarea F will be handled and disposed of, if subarea F is included in the final dredge footprint.	3
62	**Hydrologic/Hydraulic Concerns**				
63	56	General	Several concerns exist with the 1D sediment transport model and 2D hydraulic model and how results from those models have been incorporated into channel design for stability and mobilization of impounded sediments. Inconsistencies or errors in the models could result in need for design revisions.	Rectify issues with the 1D and 2D models as further described in comments 25-29 below. Once corrected, consider design revisions as appropriate.	1, 2, EPA will consider & discuss with PRP in model re-evaluation.
64	57	General	Bankfull flows, which are very important in the hydraulic model and design, are estimated by GEI to be at least 25%-35% higher than bankfull flows estimated by AECOM in 2017 2900 cfs @ Trowbridge from 2017, 2695 cfs @ Allegan City 2022, GEI is 3630 cfs bankfull in design report. This suggests the bankfull discharge may be overestimated resulting in bank-height ratios, channel incision, and some other measures, likely higher (therefore, less acceptable to the State) than those represented in the design report and may result in instability of the proposed design.	Provide justification for using bankfull discharges that differ that much from those we know to be diligently prepared.	2,EPA will consider & discuss with PRP in model re-evaluation.
65	58	General	Previous estimates of bankfull discharge at Trowbridge Dam have been significantly lower than what GEI has used in their design. Differences are on the order of 1000cfs (25-33%). Overestimating bankfull discharge would result in overestimating of bankfull depth and skew of several of the metrics used to perform geomorphic assessment of channel stability.	Continue to work with AECOM, USGS, and others to developed a better understanding of bankfull discharges along the Kalamazoo River. Adjust design flows and overall design as appropriate once bankfull discharged is confirmed/revised.	2, EPA will consider & discuss with PRP in model re-evaluation.
66	59	1D/2D Model Comparison	No comparison of the 1D HEC-RAS model used for sediment transport to the 2D HEC-RAS model used for other purposes has been provide to state agencies. Though differences resulting from computational methods utilized by the models are expected, the models should show a certain level of agreement when comparing water surface profiles, velocities, etc..	Provide a comparison of the two models and rectify/explain any differences observed.	2, EPA will consider & discuss with PRP in model re-evaluation.
67	60	2D Model Review	There are appear to be several instances where the bathymetric surface does not tie into the topographic surface appropriately. These apparent issues result in what resemble levees or berms alongside the channel in several locations and would be expected to skew model results if not representative of real features.	Review the bathymetric/data and rectify any areas where levees/berms are depicted in the model but do not exist in the field.	2, EPA will consider & discuss with PRP in model re-evaluation.
68	61	Removal Work Plan Draft, Revision 1 Appendix A, H&H Modeling	GEI HEC-RAS 1D and 2D models. Suggestion for improved model performance, modeling team communication, and/or project clarity.	Ensure proper contraction/expansion coefficients are applied at WCS, and the dam structures. Typical values of contraction/expansion are 0.3 and 0.5, respectively for contraction and expansion. The dam and WCS have contraction and expansion as well vertically.	2, EPA will consider & discuss with PRP in model re-evaluation.
69	62	Appendix A, DRRS Design Summary	Figure 22 shows the current and model simulated future bed and water surface elevations for Area 4. It would be helpful if this figure included (or an additional figure is added) the PCB dredge and pilot channel footprint. EGLE has several comments and observations about what is shown in Figure 22, which are detailed below. 1. the river channel depth along the thalweg profile from RM46.3 to RM47 is very shallow under the average daily flow conditions, and in a few locations there are "pinch points" where water depths are approximately two feet or less under average daily flow conditions. What, if any, uncertainty exists in the potential dam-out water elevation? If significant uncertainty exists, the potential range of conditions should be shown so the range of conditions under a dam-out scenario can be understood. Also, is two feet (or less) of water depth under average daily flow conditions sufficient to pass fish and watercraft? See #2 and #3 below. 2. A few of the riffles in this figure look steep, very steep. In particular, the riffles at RM44.95, RM45.7, and RM46.4 appear steeper than the other nine (9) riffles that are proposed. And, water depths at the RM46.3, RM 46.4 and RM47 are very shallow under average daily flow conditions. Will those conditions provide passage for fish and watercraft? It would seem that the combination of these conditions- the steepness of the riffle and limited water depths- coupled with high flow velocities in these locations under the proposed future condition would be potentially unsafe and portions of the reach would be impassable. What, if anything, can be done to create conditions that would provide safe and suitable passage in these particular locations? 3. As previously mentioned, the riffle that is proposed to be installed at the current site of the Trowbridge dam (RM 44.95) is steep, very steep. Using the scales provided is difficult, but it appears this riffle has a 6-10% slope. Water depths in a dam out scenario and under average daily flow conditions in this location appear to be on the range of about two (2) to three (3) feet. If the riffle were elongated and extended downstream past the scour hole to RM44.7 or RM44.8, the riffle slope would be reduced and comparable to slopes for the majority of riffles that are proposed for the project. And, the water depth under average daily flow conditions would likely also increase slightly. 4. At RM46.4, which is between two proposed riffles, the future bed elevation cuts down but stops at the Alluvial Base Elevation. Are model inputs/outputs being controlled such that the alluvial base at RM46.4 (or in other locations) is 'unerodable'? In that particular location it would seem that a lot is hinging on the ability of underlying material being able to handle future conditions such that the underlying assumptions of the depth (elevation) and nature (i.e., grain size) of that layer is critical to the long-term channel stability in this reach. Profiles generated using the available A4 TCRA PDI poling data show that soft sediment packages near RM46.4 that are outside of the proposed pilot channel and present in channel margins along both the left and right descending bank are more than 10 feet thick. 5. Similar to the Item #4 (above), are model inputs/outputs being controlled such that the sediments and banks located upstream of RM47.25 are 'unerodable'? The figure shows the future dam-out stable bed elevation but it isn't clear if there is an expectation that soils/sediments currently residing above RM47.25 will mobilize.	Provide information and include uncertainty in dam-out water levels under a range of conditions. Or, identify where these details can be located in the submittal package. Provide information on the proposed riffle construction. Or, identify where these details can be located in the submittal package. Clarify if the water depth and riffle design details are sufficient to provide passage for fish and watercraft. At select locations, compare and contrast the current riffle design to alternate designs (i.e., elongation of the riffle(s)) to evaluate things like water velocity over the riffle, water depth at/near the riffle, the confidence that the future conditions can adequately and safely pass fish and watercraft, recreator safety, constructability, cost, etc. Besides poling data, what information is available (i.e., geotechnical, chemical, etc.) to characterize the material at or near the riffle proposed at RM46.4 such that we have confidence in the long-term stability of material in/around that location? Clarify assumptions/results from sediment transport modeling. Or, identify where these details can be located in the submittal package.	1, 2, EPA will consider & discuss with PRP in model re-evaluation.
70	**Public Safety/Use Concerns**				
71	63	General	The current design raises several concerns with related to public safety and recreational use of the river post implementation of the TCRA as currently designed, potentially increasing risk and liability of the project team. In addition to stability and other requirements of the TCRA Action Memo, public safety and recreational use need to be highly prioritized design considerations.	Consider design revisions that would provide equal or greater public safety and recreational use as other unimpacted reaches of the Kalamazoo River.	1
72	64	220831_GEI_A4 TCRA_Kalamazoo River Water Velocity Profiles & Figure 26a. Area 4 Plan View of Water Depth for Average Daily Flow in Modeled Alignment & Area 4 TCRA Hydrology, Hydraulics and Sediment Transport Model Technical Memorandum Figure 11	The proposed design poses a considerable safety hazard for recreational users. Proposed riffles exceed slopes and velocities that are observed naturally in the Kalamazoo River or that existed in the pre-dam channel in Area 4. Isolated impacted reaches of the river (e.g., the constructed riffle and unnatural constriction in Area 3) should not be considered as representative of the Kalamazoo River as much of the river is suitable for wading and navigation. Risks to wading anglers or (more likely) capsized paddlers were evaluated using the criteria proposed by Shand et al (2011) for adults. Using the velocity profiles from 220831_GEI_A4 TCRA Water Velocity Profiles and water depths inferred from Figure 26a, approximately 2/3 of the points across all transects have depth*velocity values indicative of significant or extreme risk. When these same risk assessments were run using average bankfull water velocities and average bankfull depths calculated from Table 11, 53 transects scored as extreme risk and the remaining 9 scored as significant risk. Danger to recreational users would be further exacerbated by the presence of the large rocks in the constructed riffles. Citation: Shand, T. D., G. P. Smith, R. J. Cox, and M. Blacka. 2011. Development of appropriate criteria for the safety and stability of persons and vehicles in floods. Proceedings of the 34th International Association for Hydro-Environment Engineering and Research Conference, June 26-July 1, 2011, Brisbane, Australia.	Riffle designs should be modified to accommodate fish passage, navigation and public safety. The ARAR target of 3 fps should be the goal for average cross section velocity during bankfull flow, but many other techniques can be employed if these velocities can be demonstrated to be difficult to achieve. If fish passage ARARs are not achievable in all riffles, the design team needs to document why ARARs are not being met to determine if appropriate measures were taken to meet SOM developed design criteria. High velocities in the riffles add to the instability of the design. Applying design changes to individual riffles must take into account stability across the project. Design changes that accommodate stability will also likely lead to reductions in velocity and riffles that are safer to navigate. We recommend reducing velocities to achieve greater stability through a variety of techniques outlined in the SOM comments. Once riffle designs are agreed upon, ideally velocities would be reduced and riffles would not require extensive armoring to attempt to produce stability. This would reduce the risk to public safety and potentially allow for navigation through the site under safe flows.	1
73	65	Appendix A, DRRS Design Summary, Figure 7	Figure 7 shows the Area 3 sediment transport calibration based on the 2016 and 2020 bathymetry data.	The model calibration appears to fit the 2020 condition fairly well, particularly for the upstream portion of the Area 3. However, below RM50.25 the model performance drops and there are larger discrepancy between the 2020 surface and the modeled surfaces. What, if anything, can be done to improve model calibration particularly for this section of Area 3? How, if at all, may this decreased model performance in Area 3 impact our decisions in Area 4? Have potential causes of decreased model performance been identified? If so, those should be included in the text.	2
74	66	Appendix A, DRRS Design Summary, Table 1	Table 1 provides predicted and observed bed volume changes in Area 3 and Area 4, which includes a change of 108,870 Area 3 from 2016 to 2020. Details of the H&H modeling effort are provided as a Memorandum. This volume is quite a bit larger than what EGLE has measured and calculated based on bathymetric surveys in Area 3 and Area 4, and the volume estimated by Wood (which was 70,000 cubic yards). Based on details in the Memorandum that is included as an attachment, it is unclear if GEI accounted sediment that was removed during the Area 3 TCRA which may account for at least some of the discrepancy	Include information on which bathymetry sets were used to generate the volumes for Area 3 and provide support for calculated volume change. If the assumptions about dynamic equilibrium that were made for Area 3 also apply to Area 4 (which is reasonable), does the differential surface between the 2013 and 2020 bathymetric surveys for Area 4 (Figure 14) support these volume estimates?	2, EPA will consider & discuss with PRP in model re-evaluation.

	A	B	C	D	E
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4	**NO.**	**REFERENCE TO GEI SUBMITTAL (i.e., Section X.X, Page XX)**	**COMMENT (+ reference(s) to support)**	**SUGGESTION / RECOMMENDATION**	**Comment # and/or Response (comment reference below)**
75	67	Appendix A, DRRS Design Summary, Memorandum	Text in the Memorandum states, "Channel and bank migration were not accounted for in the current-conditions model since the current conditions represent a stable impoundment with no historical evidence of channel evolution or migration across the 2013 to 2020 calibration period." Are these statements accurate given what we know about bank erosion and conditions in Area 4 which are (in part) driving the need for a removal action?	How, if at all, was the observed bank erosion in Area 4 incorporated into the model? The available erosion pin data should be incorporated into this assessment and updated erosion pin data should be collected to fine-tune inputs and account for erosion over this time period, which closely corresponds to initiation of the SRI and submittal of the final SRI Report.	2, EPA will consider & discuss with PRP in model re-evaluation.
76			**Biological/Ecological Concerns**		
77	68	General	The state has several remaining concerns related to impacts to wildlife and degradation of habitat conditions resulting from the proposed design.	Consider and implement activities to protect and enhance ecological conditions as described in comments 33-35.	2, will be considered in the informal Endangered Species Act (ESA) consultation at the RI/FS stage and Mussel Work Plan. EPA will continue to consult and coordinate with the State on work plan development/changes.
78	69	Removal Work Plan Draft, Revision 1, Section 7.5.1 and Revised Design Supplemental Submittals Memo 9/1/22, p. 2	MDNR's comments on the Mussel Work Plan and 60% design regarding mussel relocation have not been addressed. While some mussel surveys and relocations have been completed within Area 4, these surveys were conducted before design revisions and did not include the full extent of the disturbed stream reaches. Increasing sediment and turbidity due to anthropogenic activities have been linked to declining mussel populations throughout North America (for examples and reviews see Box and Mossa 1999; Goldsmith et al. 2020; Landis et al. 2013 and 2015; Henley et al. 2000; Osterling et al. 2010). Individual mussels experience both chronic and acute stress when exposed to high sediment loads in water and increased sedimentation or burying. We agree that mussel communities do persist in turbid water of the US, but there are significant differences in communities, species present, and morphological adaptations that allow these populations to persist. The Michigan Mussel Protocol specifically outlines the need to conduct mussel relocations in areas of direct impacts and buffers around these areas if any dredging, mussel bed erosion, mussel bed burying, or impact due to construction activities is expected.	Downstream of the existing dam, mussels should be relocated from areas that will be directly impacted by installation of the turbidity curtains as well as areas that will be indirectly impacted by sediment accumulation upstream of the curtains. The dredging footprint in Subareas C and D also has been expanded due to the addition of a pilot channel. Mussels should be moved out of the proposed pilot channel before dredging and out of the area where sediment mobilization is expected. Mussel relocation efforts should follow the Michigan Freshwater Mussel Survey Protocols and Relocation Procedures for Rivers and Streams - version 3. The effort should be conducted between June 1 and October 15.	to be addressed in Mussel Work Plan. EPA will continue to consult and coordinate with the State on work plan development/changes.
79	70	Area 4 TCRA Hydrology, Hydraulics and Sediment Transport Model Technical Memorandum Figure 23 and 220831_GEI_A4 TCRA_Kalamazoo River Velocity Profiles.pdf	The proposed design would not facilitate upstream movement of native fish species. To allow upstream passage of all fish species and life stages, average velocities across a transect should be below 3.0 ft/s for flows up to and including the bankfull discharge. According to Figure 23, average daily modeled future average velocity exceeds 3.0 ft/s at twelve locations. At bankfull discharge, the modeled future average velocity exceeds 3.0 ft/s throughout most of the Area 4 TCRA reach, including everything upstream of RM 47.18. These velocities exceed what naturally occurs in the Kalamazoo River. The rock sizes proposed to ensure the riffle substrate is stable are much larger than pebble size found in naturally existing riffles in the Kalamazoo River or substrate found onsite.	Riffle designs should be modified to accommodate fish passage, navigation and public safety. The ARAR target of 3 fps should be the goal for average cross section velocity during bankfull flow, but many other techniques can be employed if these velocities can be demonstrated to be difficult to achieve. If fish passage ARARs are not achievable in all riffles, the design team needs to document why ARARs are not being met to determine if appropriate measures were taken to meet SOM developed design criteria. High velocities in the riffles add to the instability of the design. Applying design changes to individual riffles must take into account stability across the project. Design changes that accommodate stability will also likely lead to reductions in velocity and riffles that are safer to navigate. We recommend reducing velocities to achieve greater stability through a variety of techniques outlined in the SOM comments. Once riffle designs are agreed upon, ideally velocities would be reduced and riffles would not require extensive armoring to attempt to produce stability. This design would better accommodate fish passage. In riffles where fish passage may still be impaired, several alternative techniques can be employed to facilitate passage of specific species (e.g. modifying riffle cross section shape to include benching, arched rock rapids, etc..)	1
80	71	General	The State will withhold comments on restoration, revegetation with native species, and other similar matters at this time and will engage to assist with developing approaches nearer the end of the design process.	EPA, NCR, and GEI should engage with the State to discuss these topics and garner comments following eventual consensus on the design.	1, EPA will continue to consult and coordinate with the State on design changes.
81	72	Section 7.5.1, Revised Design Supplemental Submittals Memo, p. 2	Downstream of the existing dam, mussels should be relocated from areas that will be directly impacted by installation of the turbidity curtains as well as areas that will be indirectly impacted by sediment accumulation upstream of the curtains.	Conduct a mussel relocation effort as described in Michigan Freshwater Mussel Survey Protocols and Relocation Procedures for Rivers and Streams - version 3. The effort should be conducted between June 1 and October 15.	to be considered in Mussel Work Plan. EPA will continue to consult and coordinate with the State on work plan development/changes.
82	73	Section 7.5.1, Revised Design Supplemental Submittals Memo, p. 2	The dredging footprint in Subareas C&D has been expanded due to the addition of a pilot channel. Mussels should be moved out of the proposed pilot channel prior to dredging.	Conduct a mussel relocation effort as described in Michigan Freshwater Mussel Survey Protocols and Relocation Procedures for Rivers and Streams - version 3. The effort should be conducted between June 1 and October 15.	to be considered in Mussel Work Plan. EPA will continue to consult and coordinate with the State on work plan development/changes.
83	74	Appendix A, 2.1, Page 4	"revert to upland floodplain" - this terminology should be avoided. Upland is, by definition, not floodplain. Therefore, the use of this term causes confusion.	use "upland" for non-wetland, upland locations, use "floodplain" for areas that are or will be floodplain (inundated with a 100-year flood maybe? just throwing out a metric). Use "wetland" for areas that are, or are expected to be, wetland. We understand the spirit of the term as used but we should stick to clear, technical language and avoid confusing uses. Additionally, that paragraph seems repetitive and could be streamlined.	3
84	75	Appendix A, 2.1, Page 4	"consistent with anabranch filling methods...." MDNR is not the owner of record for the areas proposed to be filled in the Area 2 ROD. It is unclear who actually owns those locations in Area 2 and, therefore, it is unclear whether the landowner was consulted or agreed to this use of their property while the Area 2 ROD was developed and publicly vetted. That said, the citizens of the SOM hold clear ownership to Subarea F and Michigan DNR is charge with management of said land on behalf of the people. MDNR does not support disposal of material in Subarea F or any other form of filling Subarea F. It is MDNR's belief that, following dam removal, this area will remain wetland. Therefore, filling of that area would constitute filling of a wetland. Removal of the dam will result in some loss of wetland area so those areas that may remain wetland post-removal should be protected to allow for the wetland impacts to be minimized. This comment is independent of the chemical analyses of the proposed fill material. The public, as the owners of the property, should not be handcuffed to restrictions on this property so that this, and future, generations can use the property in line with their values and goals.	Look for other disposal routes for dredged materials not required to go to landfill due to PCB contamination and ensure that, following remediation, there are no deed restrictions on the property.	3
85	76	Section 6.3	Construction of sediment traps may require additional mussel surveys if beds that have not been cleared will be disturbed.	Consult with DNR regarding the mussel survey requirements.	to be considered in TMP, Mussel Work Plan. EPA will continue to consult and coordinate with the State on work plan development/changes.
86	77	Section 9.16	Field monitoring plan does not include BMPs and monitoring for organisms in the work area.	Consider including these to prevent unnecessary loss of organisms on the construction site.	to be considered in TMP/FMP components. EPA will continue to consult and coordinate with the State on work plan development/changes.
87			**General Concerns / Compliance with ARARs**		
88	78	General	The proposed design does not meet multiple State ARARs. No alternatives analysis or sensitivity studies were provided. Without information on the design constraints, considered alternatives, and associated tradeoffs, it is impossible to determine if the proposed design complies with ARARs to the maximum extent practicable.	For each ARAR that is not met, please provide a written description of the alternatives considered, tradeoffs (e.g., ecological, geomorphological, stability, and financial) associated with each alternative, and associated design constraints.	Pursuant to 40 CFR 300.415, removal actions need to attain identified ARARs "to the extent practicable considering the exigencies of the situation." To date, EPA has not identified any State ARARs in relation to the TCRA. Pursuant to 40 CFR 300.525, States are responsible for providing potential state ARARs to EPA in a timely manner for all EPA-lead removal actions. EPA requested that the State identify its ARARs related to the proposed TCRA in June of 2019, and the State did not reply to EPA's request until May of 2020, which was after the Action Memo (AM) for the TCRA was signed. EPA did not review the ARARs submitted by the State for purposes of inclusion in AM, and for this reason the document was not submitted to NCR for purposes of TCRA implementation, rather EPA forwarded the information to NCR for purposes of transparency.
89	79	RWP	Tables 2,3,4 include a long list of applicable or relevant and appropriate requirements (ARARs), and text in Section 7.7 mentions that Tables 2,3,4 show ARARs taken from EGLE's May 2020 submission. EGLE appreciates the identification of state applicable or relevant and appropriate requirements (ARARs) in the Removal Work Plan Draft, Revision 1.	As demonstrated by the other comments on the Work Plan, EGLE and DNR do not believe, however, that all state ARARs are being met. Additionally, more information is needed regarding implementation of the Work Plan to determine compliance with state ARARs.	See response to comment #78. EPA will review the ARARs provided by NCR in the revised workplan and will continue to consult with the State to ensure that the objectives of the AM are being met and the removal action is being performed in a manner consistent with the NCP. The State will have an opportunity at the RI/FS stage of the CERCLA remedial response related to Area 4 of OU5 to timely idenitfy potential State ARARs for EPAs review and consideration.
90	80	Section 7	The text describes that to extent practicable within the scope of work defined in the CD, meeting the substantive State and local requirements will be demonstrated in consultation with EPA. Subsections in Section 7 outline these requirements, but there is no documentation of how these were met, where they were not met, and how the assessment was made to determine they were met to the extent practicable.	Provide a list of requirements not met and the reasoning why it was not practicable to meet. There is no current documentation that efforts were made to meet these requirements.	See response to comment #78. EPA will review the ARARs provided by NCR in the revised workplan and will continue to consult with the State to ensure that the objectives of the AM are being met and the removal action is being performed in a manner consistent with the NCP. The State will have an opportunity at the RI/FS stage of the CERCLA remedial response related to Area 4 of OU5 to timely idenitfy potential State ARARs for EPAs review and consideration.
91	81	RWP (duplicate)	Tables 2,3,4 include a long list of applicable or relevant and appropriate requirements (ARARs), and text in Section 7.7 mentions that Tables 2,3,4 show ARARs taken from EGLE's May 2020 submission. EGLE appreciates the identification of state applicable or relevant and appropriate requirements (ARARs) in the Removal Work Plan Draft, Revision 1.	As demonstrated by the other comments on the Work Plan, EGLE and DNR do not believe, however, that all state ARARs are being met. Additionally, more information is needed regarding implementation of the Work Plan to determine compliance with state ARARs.	See response to comment #78. EPA will review the ARARs provided by NCR in the revised workplan and will continue to consult with the State to ensure that the objectives of the AM are being met and the removal action is being performed in a manner consistent with the NCP. The State will have an opportunity at the RI/FS stage of the CERCLA remedial response related to Area 4 of OU5 to timely idenitfy potential State ARARs for EPAs review and consideration.
92	82	Response To Comments (RTC) on the Pre-Design Investigation (PDI) Report	The RTC for the PDI Report includes a tracking table but does not include responses to comments that were provided. The tracking table that was provided makes it difficult to understand the extent to which comments that were provided were or were not incorporated into the PDI Report and associated documentation.	In the future, provide a formal RTC for documents.	refer to this spreadsheet. RTCs developed by the PRP have been provided to the State.
93	83	Removal Work Plan (RWP)	Section 1.3 Project Schedule states, "The schedule will be updated routinely as part of monthly progress reporting and provided to EPA for review."	Change the text to read, ""The schedule will be updated routinely as part of monthly progress reporting and provided to EPA for review and approval."	will consider wording change in monthly progress reports.
94				EGLE will provide comments for each item, in the order they are provided in the text.	

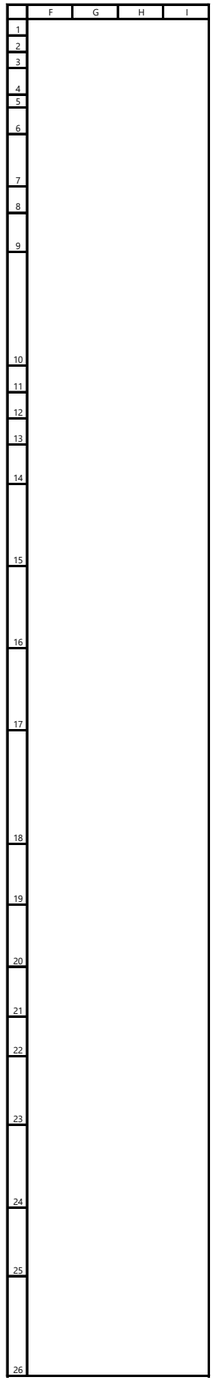
Section 2.1 Location and Current Site Description, page 14, states the following: "Area 4 is divided into the following eight sediment Subareas (Fig. 2):
1. Subarea A extends from the former Otsego Dam downstream to approximately RM 48.35, which is near the upstream extent of the historical impoundment of the Trowbridge Dam.
2. Subarea B extends from Subarea A (RM 48.35) downstream to approximately RM 47.25, which is the approximate upstream extent of the current Trowbridge Dam impoundment.
3. Subarea C extends from Subarea B (RM 47.25) downstream to approximately RM 46.65, which is just upstream of the mouth of the Schnable Brook tributary.
4. Subarea D extends from Subarea C (RM 46.65) downstream to approximately RM 45.70, where a change in sediment PCB concentration patterns was observed based on historical sampling data (Amec Foster Wheeler, 2018).
5. Subarea E extends from Subarea D (RM 45.70) downstream to the Trowbridge Dam (RM 44.9).
6. Subarea F includes the side channel south of Subarea E.
7. Subarea G includes the backwater area on the eastern floodplain north of Subarea E.
8. Subarea H includes the areas of inundation along Schnable Brook east of Subarea D.

TCRA work will be limited to Subareas C through G. However, evaluation of conditions between Trowbridge Dam and the 26th Street Bridge was conducted to understand potential conditions after Trowbridge Dam removal. The scope and extent of this work was developed during the design process.

1. When it was at it's maximum elevation, the Trowbridge dam impounded water up to the former Otsego Township dam, as shown in several historic aerial images that are available in the SRI Report (i.e., 1938, 1960, 1967). Revisit the text accordingly.
2. Given that the Area 4 TCRA pre-design investigation determined that the extent of the current Trowbridge Dam impoundment extends to Subarea B, which is further upstream than the TCRA boundary, contaminated sediments and banks soils in the upstream Subarea(s) could be subject to erosion. How will potential recontamination of the current TCRA footprint and exacerbation of existing conditions be avoided? How will upstream locations be monitored? Edit the last paragraph to include "...evaluation of conditions up to the current extent of the Trowbridge Dam impoundment."
3. No change.
4. Section 2.1 is titled Location and Current Site Description. However, item #4 references a section of Wood's 2018 SRI Report discussing a "change in sediment PCB concentration patterns". In general, the Area 4 SRI (Table 4-2) shows this "change" is a significant and progressive increase in the total PCB surface area weighted average concentration (SWAC) in surface sediments, and this increase occures across all depth intervals for all Subareas downstream of Subarea D (Subareas E, F & G). Revise the text to state, "..where a significant increase in sediment PCB concentration patterns was observed based on SRI sampling data (Amec Foster Wheeler, 2018)."
5. No change.
6. No change.
7. All of these items are taken directly from the Area 4 SRI Report Section 4.1.1., except for item #7. Revise the text to be state, "Subarea G includes the inundated area on the right floodplain north of Subarea E (Amec Foster Wheeler, 2018)."
8. No change.

	A	B	C	D	E
3	**DOCUMENT NAME: Revised Removal Work Plan, version 08/17/2022**				
4	**NO.**	**REFERENCE TO GEI SUBMITTAL (i.e., Section X.X, Page XX)**	**COMMENT (+ reference(s) to support)**	**SUGGESTION / RECOMMENDATION** EGLE will provide comments for each item, in the order they are provided in the text.	**Comment # and/or Response (comment reference below)**
95	84	RWP	Section 2.1 Location and Current Site Description, page 14, states the following: "Area 4 is divided into the following eight sediment Subareas (Fig. 2): 1. Subarea A extends from the former Otsego Dam downstream to approximately RM 48.35, which is near the upstream extent of the historical impoundment of the Trowbridge Dam. 2. Subarea B extends from Subarea A (RM 48.35) downstream to approximately RM 47.25, which is the approximate upstream extent of the current Trowbridge Dam impoundment. 3. Subarea C extends from Subarea B (RM 47.25) downstream to approximately RM 46.65, which is just upstream of the mouth of the Schnable Brook tributary. 4. Subarea D extends from Subarea C (RM 46.65) downstream to approximately RM 45.70, where a change in sediment PCB concentration patterns was observed based on historical sampling data (Amec Foster Wheeler, 2018). 5. Subarea E extends from Subarea D (RM 45.70) downstream to the Trowbridge Dam (RM 44.9). 6. Subarea F includes the side channel south of Subarea E. 7. Subarea G includes the backwater area on the eastern floodplain north of Subarea E. 8. Subarea H includes the areas of inundation along Schnable Brook east of Subarea D. TCRA work will be limited to Subareas C through G. However, evaluation of conditions between Trowbridge Dam and the 26th Street Bridge was conducted to understand potential conditions after Trowbridge Dam removal. The scope and extent of this work was developed during the design process.	1. When it was at it's maximum elevation, the Trowbridge dam impounded water up to the former Otsego Township dam, as shown in several historic aerial images that are available in the SRI Report (i.e., 1938, 1960, 1967). Revisit the text accordingly. 2. Given that the Area 4 TCRA pre-design investigation determined that the extent of the current Trowbridge Dam impoundment extends to Subarea B, which is further upstream than the TCRA boundary, contaminated sediments and banks soils in the upstream Subarea(s) could be subject to erosion. How will potential recontamination of the current TCRA footprint and exacerbation of existing conditions be avoided? How will upstream locations be monitored? Edit the last paragraph to include "...evaluation of conditions up to the current extent of the Trowbridge Dam impoundment." 3. No change. 4. Section 2.1 is titled Location and Current Site Description. However, item #4 references a section of Wood's 2018 SRI Report discussing a "change in sediment PCB concentration patterns". In general, the Area 4 SRI (Table 4-2) shows this "change" is a significant and progressive increase in the total PCB surface area weighted average concentration (SWAC) in surface sediments, and this increase occures across all depth intervals for all Subareas downstream of Subarea D (Subareas E, F & G). Revise the text to state, "..where a significant increase in sediment PCB concentration patterns was observed based on SRI sampling data (Amec Foster Wheeler, 2018)." 5. No change. 6. No change. 7. All of these items are taken directly from the Area 4 SRI Report Section 4.1.1., except for item #7. Revise the text to be state, "Subarea G includes the inundated area on the right floodplain north of Subarea E (Amec Foster Wheeler, 2018)." 8. No change.	1, edits will be taken into consideration.
96	85	Figure 4-1	Figure 4-1 provides locations where PCB contaminated banks that exceed the 5 part-per-million (ppm) total PCB remedial action level (RAL) for riverbanks that was established in the Action Memorandum. EGLE reviewed the SRI data available and performed a cross-walk between the Region 5 Action Memo and the available SRI dataset for Area 4 using the Region 5 Viewer and Figures 3 and Figure 4 in the Action Memorandum. EGLE's review shows that there are inconsistencies between the Area 4 SRI dataset and what is shown in the Action Memorandum. This cross-walk was shared with the US EPA in May 2022 and is summarized below. First, EGLE noted that sample locations (shown as "stream tubes" and "bank grids") in the TCRA footprint with data above the Area 4 TCRA RALs (1 ppm total PCBs for sediments and 5ppm total PCBs for bank soils) were incorrectly shown as "clean" (less than the applicable RALs). Second, EGLE also noted that the interpolation is not logical. For example, bank grids and stream tubes that would be expected to exceed the applicable RAL established in the Area 4 Action Memorandum based on proximal data are incorrectly shown as "clean". As EGLE reviewed the Area 4 database and examined the matrix classification assigned to SRI and pre-SRI samples it appears that "sediment" samples are also not being treated consistently. For example, most of the sediment stream tubes in Subarea F that are highlighted as >1ppm in the Action Memorandum are SRI samples classified as "soil in a sediment defined area" but there are also sample locations collected from other subareas (i.e. four [4] from Subarea H) that were also classified as "soil in a sediment defined area" that exceed the 1ppm total PCB RAL for sediment, and are not highlighted in the Action Memo. Of those four (4) locations, three (3) locations have samples >5ppm. In total, the errors identified by EGLE impact approximately 20 bank grids and 2 stream tubes.	Adjust the approach so that it meets the requirements of the removal action. Review the data in-hand (pre-SRI, SRI, post-SRI, and PDI) to define the nature and extent of PCB contamination within the TCRA footprint, identify locations with soils and/or sediments above the established RALs within the TCRA footprint and remove those materials accordingly. The TCRA footprint covers in-stream sediments and riverbanks in a 2.4-mile stretch of Area 4, which was based on our previous understanding of the current influence of the Trowbridge dam. Locations that are not being remediated as part of the TCRA should immediately be incorporated into the Area 4 FS, which includes all of Subarea H and portions of Subareas C/D/E/F/G. The revised TCRA footprints should also be incorporated into an Area-wide FS or a separate Focused FS to evaluate the residual risks that remain after completion of the TCRA is completed.	1, 4, for consideration in remedial phase.
97	86	RWP	Section 4.0 Pre-Design Investigation, page 19, includes a list of tasks and objectives. Item number one (#1) states, "1. Refining the horizontal and vertical extent of PCBs in bank soils and near-bank sediments in Subareas C, D, and E with PCB concentrations equal to or greater than the cleanup standards of 5.0 mg/kg and 1.0 mg/kg, respectively. These data were used in coordination with historical data (as applicable) to define the bank segments requiring removal to meet the TCRA cleanup standards. Historical data were included except for bank areas showing signs of recent erosion." First, this is the first EGLE has hard of using data in this way. The available GPS data for "historical data" and PDI data should provide a good indication if a significant quantity of material has eroded from that location such that the "historical" sample no longer exists. If historical data were not included because banks were suspected to have eroded, were additional samples collected to evaluate the current nature and extent of contamination on the bank? Were samples collected from the toe of bank to determine if the eroded bank materials had deposited and remained along the edge of the bank in the river channel? Item number two (#2) in that list states, "2. Refining the horizontal and vertical extent of PCBs in current in-stream sediments in Subareas E, F, and G with PCB concentrations equal to or greater than the cleanup standards of 1.0 mg/kg. These data were used to define the dredge prisms requiring removal to meet the cleanup standards intended to achieve the post-removal SWAC standard. Historical sediment data were used for sampling design purposes only because older sediment data were unlikely to be representative of sediment conditions at the time of the PDI." Portions of these statements are confusing based on how "historic" data was actually used during the PDI. If historical data are unlikely to be representative of sediment conditions at the time of the PDI then why was the historical data used to determine where samples would and would not be collected during the PDI instead of just simply sampling the entirety of the TCRA footprint to evaluate the current nature and extent of contamination? What analysis has been done showing that the removal action, as planned, will achieve a post-removal SWAC of 0.33 mg/kg?	Provide an explanation for how "historical data" was used when bank areas were showing "signs of recent erosion". Edit the text and add statements to clarify the last sentence in Item #2, or delete the last sentence. Provide an analysis to support statements regarding ability to achieve a post-removal SWAC of 0.33ppm in the TCRA footprint following completion of the removal action. Add text to the RWP that discusses how and when the post-removal PCB SWAC will be determined in order to evaluate the effectiveness and ability of the removal action to achieve a post-removal SWAC of 0.33 mg/kg.	1, to be considered in remedial phase.
98	87	RWP	Table 2 includes a line item for "Risk-based soil criteria", and a portion of the line item includes the following: Site-specific TEQ risk-based thresholds in soil: Mammalian receptors: 1,000 ng/kg Avian receptors: 7,000 ng/kg Recreationist: 1,330 ng/kg	Remove references to Total TEQ values, as these are not final remediation goals. Furthermore, the proposed PRG for recreationalists is 990 ng/kg not 1,330 ng/kg. As detailed in our comments on the SRI Report, EGLE does not support these clean-up values since they are not protective of ecological receptors and a total TEQ value of 350 ng/kg to 400 ng/kg would be needed to protect recreationalists.	EPA will consider & discuss edit with PRP.
99	88	Appendix A, DRRS Design Summary, Figure 4	Figure 4 shows that PCB releases into the reservoir occurred from 1957-1971.	It would be more accurate to state "Carbonless copy paper manufactured between 1957 and 1971 contained PCBs as an ink carrier" since discharges of PCBs into the reservoir occurred well after 1971. Revise the figure accordingly.	EPA will consider & discuss edit with PRP.
100	89	General	Plan-view figures that show river channel and/or floodplain elevations (e.g., Figure 16)	For figures that show river channel elevations, it would be helpful to use a color ramp and scale that allows the user to readily see differences between and high low elevations and provides higher resolution. EGLE prefers a Red-Green-Blue color ramp that covers high to low elevations set at a 6" contour interval, and contour lines "turned on". Given the wide range of elevations that exist (>50ft in Fig. 16), separate figures for bathymetric and topographic surveys may be necessary. Please also include a horizontal scale on figures. Figure 16, as presented, is very difficult to interpret because of the color ramp and scale used.	1, 4, EPA will consider & discuss edit with PRP.
101	90	Turbidity Monitoring Plan & Field Monitoring Plan	EGLE previously communicated that we would provide comments on the Turbidity Monitoring Plan (TMP) and Field Monitoring Plan (FMP) once the design had been further developed, so comments on that document are provided here-in	1. Clarify the intent of collecting "background" data in July 2021 and how this information is or is not being used. 2. Given the sequencing of work and the long duration of the project, it would be prudent and reasonable to move the monitors as work shifts from dredging to bank work (and vice versa) so that the monitoring network is appropriately designed. And, when hydraulic dredging in Subarea E, it would make sense to keep a monitor at a safe but set distance (i.e., 250-500 ft.) downstream of the hydraulic dredge while operations are ongoing. 3. Following completion of hydraulic dredging in Subarea E, it would make sense to keep a monitor somewhere in Subarea E to monitor the potential for sediment migration into dredged area and/or water quality exceedance while the next phase of work occurs in Subarea F and G. Following completion of work in Subarea E,F,G, it would make sense to move the remaining monitor located below the dam to the upstream boundary of the PCB dredge (approx. RM 45.7), and then move the monitor used during hydraulic dredging to the downstream boundary of each Subarea where bank work will occur. For example, while completing bank remediation in Subarea C the monitoring network would be configured as follows: one monitor would be located near RM45.7 (the upstream boundary of the PCB dredge in Subarea E); one monitor between RM46.7 and RM46.6 (at the boundary between Subarea C and D); and one monitor would be located at RM47.15 (the reference location). When doing bank work and riffle construction in Subarea E, particularly the furthest downstream banks and the riffle at the current dam location, it would make sense to have one (or even two) monitors located below the current dam. 3. The Revised Design Package includes installation of a "sediment trap" near the Trowbridge dam that is not shown included on figures or text in the TMP and FMP. Relevant documents should be updated to include the sediment trap as well as a frequency for monitoring and maintaining the sediment trap(s). Is there a plan to quantify and/or characterize materials contained in the sediment trap to estimate downstream loading? 4. Given the proposed sequence of work and potential for mobilization of contaminated materials from upstream Subareas into Subarea E during dewatering and construction, the work group should consider adopting lower turbidity action levels to provide real-time information that can be used to asses the effectiveness of BMPs and adjust work, as necessary. 5. The document states that turbidity levels will be used to evaluated changes in river conditions that result from dredging, excavation, and restoration. EGLE notes that turbidity levels will also be impacted by dewatering activities and the sediments that are being left behind and allowed to mobilize under the current design. It is possible that this mobilization and the resultant increase in turbidity may (by itself and absent of impacts caused by the previously mentioned activities) exceed water quality standards, and mitigation could be required.	1, EPA will consider & discuss with PRP in TMP/FMP development. EPA will continue to consult and coordinate with the State on work plan development/changes.
102	91	Section 3 Project Approach, Section 4, Pre-Design Investigation	Samples were collected to identify river turbidity data to identify background turbidity and baseline conditions.	Continuous turbidity monitoring should take place downstream to assess water quality impacts, and immediately upstream of the project area throughout the duration of the project in order to establish baseline conditions.	EPA will consider & discuss with PRP in TMP/FMP development. EPA will continue to consult and coordinate with the State on work plan development/changes.
103	92	Section 3 Project Approach, Section 5.1.5, Turbidity Controls, Section 5.2.2 Turbidity Monitoring	Section 5.1.5 text suggests that turbidity curtains, screens, and temporary sheet pile cofferdams will be evaluated as a means to control turbidity. Section 5.2.2 mentions action levels for turbidity, with values to established in the SESC plan.	Turbidity screens should be utilized and their performance should be evaluated continuously throughout mobilization of equipment, construction, and all applicable site activities. Turbidity in excess of upstream reference values should trigger stop of work, evaluation of controls, and implementation of additional controls, as necessary. EGLE should have the opportunity to review turbidity action levels and actions associated with those levels within the SESC plan, prior to finalization and implementation.	EPA will consider & discuss with PRP in TMP/FMP development. EPA will continue to consult and coordinate with the State on work plan development/changes.
104	93	Section 3 Project Approach, Section 7.8, MDNR Land Use Permits	What if the proposed remedy fails to reduce fish concentrations, and the channel becomes unstable, requiring additional in-stream dredging or management of spoils in the proposed subarea F?		1, 3
105	94	Appendix A, 2.2, Page 4	"1967" State acquired the dam in 1967 but State records indicate that the dam was decommissioned in 1964.	change to reflect. Point is, the dam was decommissioned before the State took ownership and that the State did not cease electric production when purchased as production was already ceased. I know this is nitpicky, but, to the State, this is an important distinction in the history of the dam.	edit to be considered.
106	95	Section 5.1.5 and 5.1.6	Turbidity curtains could be installed prior to installation of coffer dams especially if jetting is proposed.	Consider include this additional protection in the plan.	EPA will consider & discuss with PRP in TMP/FMP development. EPA will continue to consult and coordinate with the State on work plan development/changes.
107	96	Section 5.2.2	Turbidity is not proposed during high flow events during which turbidity conditions could peak. It is not clear how often this will occur. Failure to monitor during conditions where sediment mobilization and turbidity are expected to be the highest is not protective of downstream and will fail to ensure corrective measures are taken when required.	Specify conditions where turbidity monitoring will stop. Consider alternative methods for evaluating turbidity during peak flows.	EPA will consider & discuss with PRP in TMP/FMP development. EPA will continue to consult and coordinate with the State on work plan development/changes.
108	97	Section 5.10	Post-Removal Site Control Plan and Long-Term Monitoring Plan have not been submitted at this time. Much of the assumed risk and long term stability of the river depend on how these plans will be implemented. At this time, it is difficult to assess if the proposed plan will address potential failures as they occur and how much liability will be shifted to the property manager (DNR). The proposed design has a high level of inherent risk by designing a high energy system with heavily rocked banks and grade control riffles. This design relies on continued maintenance and monitoring with emergency response capabilities if these begin to fail.	Once plans are submitted, the SOM will need to review and determine if monitoring and maintenance plans will sufficiently protect the public property and the people of the SOM. The willingness to accept risk associated with the design hinges on the protections outlined in these plans.	EPA will consider & discuss with PRP in PRSC work plan develoopment. EPA will continue to consult and coordinate with the State on work plan development/changes.

	A	B	C	D	E
3	**DOCUMENT NAME: Revised Removal Work Plan, version 08/17/2022**				
4	**NO.**	**REFERENCE TO GEI SUBMITTAL (i.e., Section X.X, Page XX)**	**COMMENT (+ reference(s) to support)**	**SUGGESTION / RECOMMENDATION**	**Comment # and/or Response (comment reference below)**
109					
110	**PRP Comment #**		**Narrative**		
111	1		The Revised Design presents risk for instability of the restored banks, particularly from river mile (RM) 45.7 to 46.3. Restored bank instability (particularly during the period following restoration activities until such time that vegetation is established) may cause erosion of near-bank floodplain soils with high levels of PCB contamination along the right descending bank through this reach. The predictive models estimate that average bankfull water velocities in several areas along this reach and other portions of the TCRA exceed 4 feet per second (ft/s). Bankfull average velocities in this range result in elevated near bank shear stresses, which contribute to bank instability. In addition, average bankfull velocities in the 4 ft/s range present a barrier for fish passage and risk to public safety. Several Bank Height Ratios (BHRs) shown in Appendix A, Attachment A, Table 11 are considered 'at risk' or 'non-functioning,' with nearly all BHRs between RM 45.7 and 46.5 in the 'non-functioning' range (>1.4). Additionally, 3 of 8 entrenchment ratios (between RM 45.7 and 46.3) listed in Appendix A, Table 5 are 2.0 or less, which are classified as 'non-functioning' in Type C channels. Design revisions should be made to reduce the average bankfull velocities for every cross section within the TCRA footprint (including Schnable Brook) to < 3.5 ft/s to lower the risks to long-term channel stability and address fish passage and public safety concerns. Reducing average bankfull velocities will also reduce the elevated near bank shear stresses which contribute to the risk of bank instability prior to vegetation establishment. Such revisions could include channel widening, floodplain benching, or other proposed options. The Revised Design also presents stability risks along the series of proposed engineered riffles. The proposed riffle construction concerns relate to fine sediments that would remain after the pilot channel dredging is complete. Constructing riffles on top of fine sediment materials may lead to undercutting or undermining of the riffle stone and resulting scour of the fine sediments beneath, which may cause a potentially harmful rate and/or magnitude of sediment migration downstream. In addition, riffle failure through scour or undermining could affect the stability of upstream riffles, compounding the channel stability risk. All constructed riffles should be keyed into the alluvium to reduce the likelihood that ongoing maintenance will be required to ensure riffle stability.		
112	2		The Revised Design estimates that up to 173,000 yd3 of remaining sediments in the Trowbridge impoundment will mobilize downstream within the first 2 years of the dam removal process. The predictive model has been used as an indicator of how design changes will impact sediment mobilization after dam removal. There are some indications in the predictive modeling documentation that, due to errors and uncertainties in the model, it may underpredict sediment mobilization. The predictive modeling should be re-evaluated and updated to correct errors and inconsistencies and improve estimates of potential sediment mobilization (rates and volumes) to ensure that risks associated with downstream sediment mobilization are adequately addressed. The design should evaluate and implement methods to decrease the total additional sediment mobilization volume resulting from the TCRA to less than or equal to the normal average annual volume of sediment transport through Area 4. While some of the conditions implemented to address the bank and channel stability concerns discussed above may reduce the estimate of downstream sediment mobilization, additional measures should also be evaluated to limit or control rate and volume of sediment transport as needed to decrease the annual mobilization volume below the normal average annual volume. The potentially erodible volume of post-dredge sediments is of concern due to the uncertain ecological risks to downstream receptors. Whole sediment toxicity testing should be conducted on erodible sediments which exceed WRD-048 screening levels to further evaluate potential downstream ecological risks and the need for additional controls to reduce sediment mobilization.		
113	3		Placement of dredged material from the proposed pilot channel in Subarea F may be inconsistent with the final remedy selected and future use of Area 4 of OU5. Identify location(s), including but not limited to Subarea F, for staging of pilot channel sediments until an agreed to appropriate long term solution for the sediments is determined in the Record of Decision (ROD) for the remedial phase of the project. Consideration should be given to segregation of these sediments into coarse and fine components, with staging and/or reutilization on Site with appropriate environmental controls.		
114	4		A PDI Phase 3 boring (4S-PC-01-2), collected from a depth of 13" - 122", revealed a discrepancy in a PDI Phase 1 boring (4S-EI20-1), on which the PCB sediment dredge prisms were based. This discrepancy should be corrected and incorporated into a revised target sediment dredge prism(s). All PDI Phase 1, 2 & 3 sampling data should be carefully reviewed to ensure the target PCB-contaminated sediments and riverbank soils are removed as required in the Action Memorandum. Figures should be provided that show a plan and profile view of TSCA and non-TSCA sediment dredge prisms and riverbank grids with proposed excavation depths.		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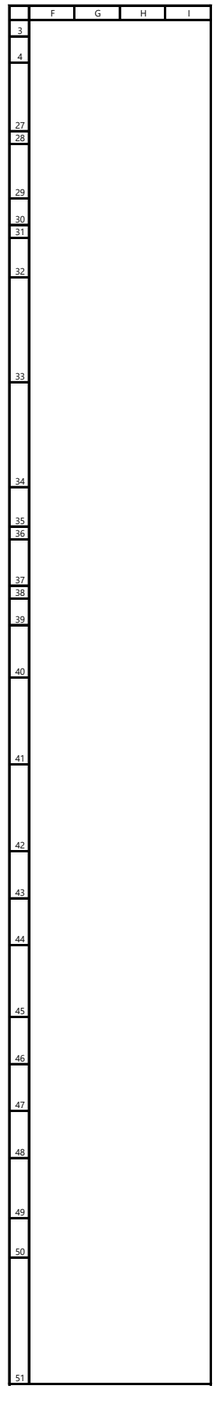
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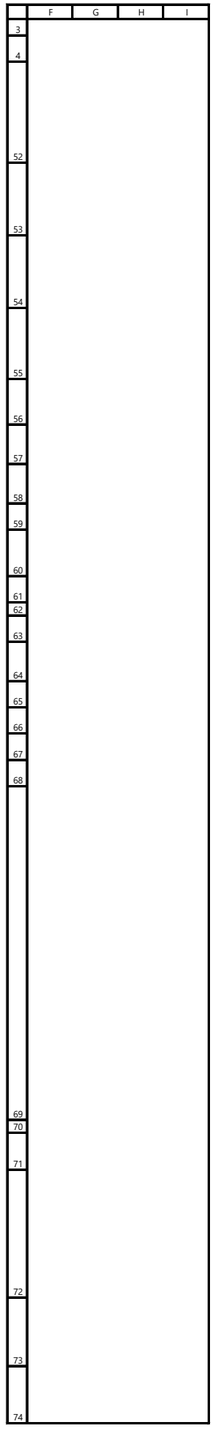
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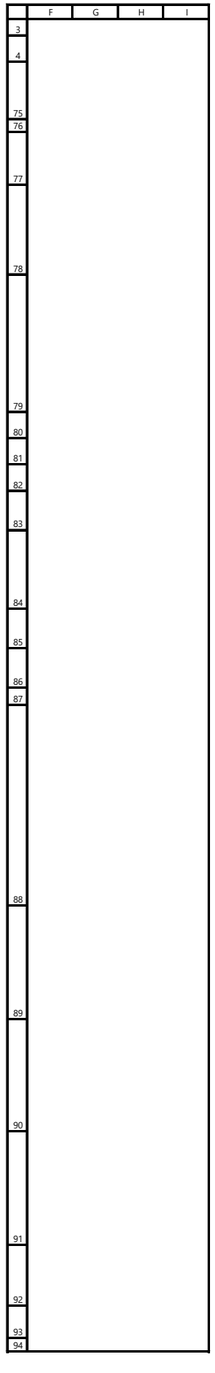
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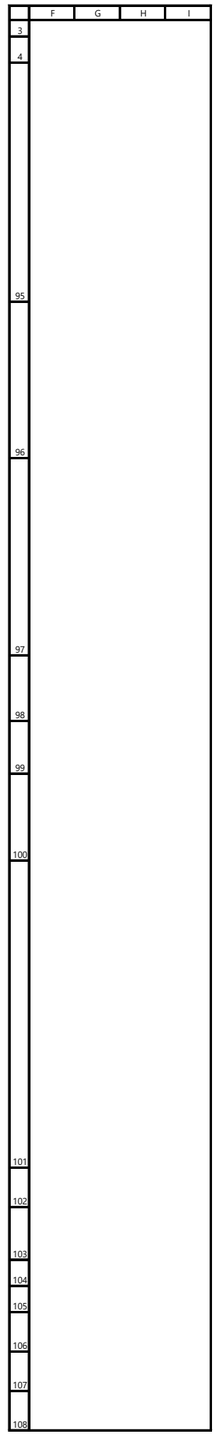
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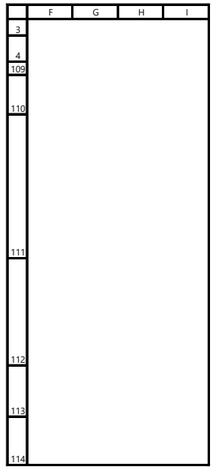
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